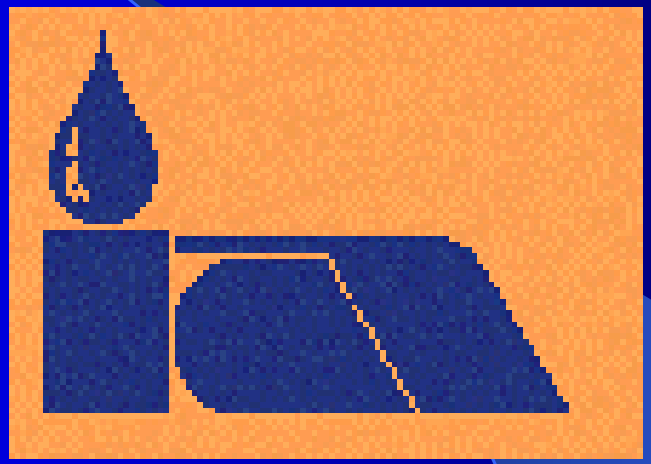
WHAT IS THE PROMISE OF NEW LANDSCAPE IRRIGATION TECHNOLOGIES FOR ENHANCING WATER EFFICIENCY?



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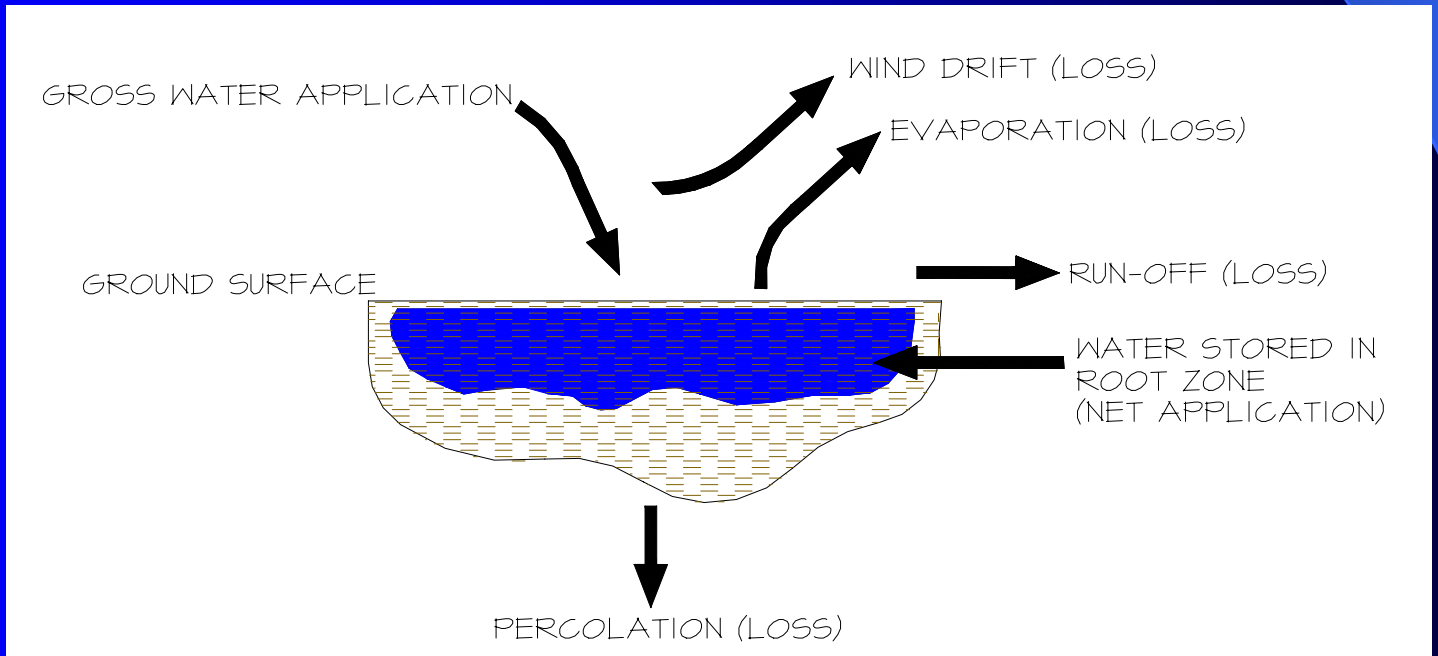
OUTLINE

- What is irrigation efficiency?
- What causes low efficiencies in an irrigation system?
- What are the current and future irrigation technologies for improving efficiencies and saving water?

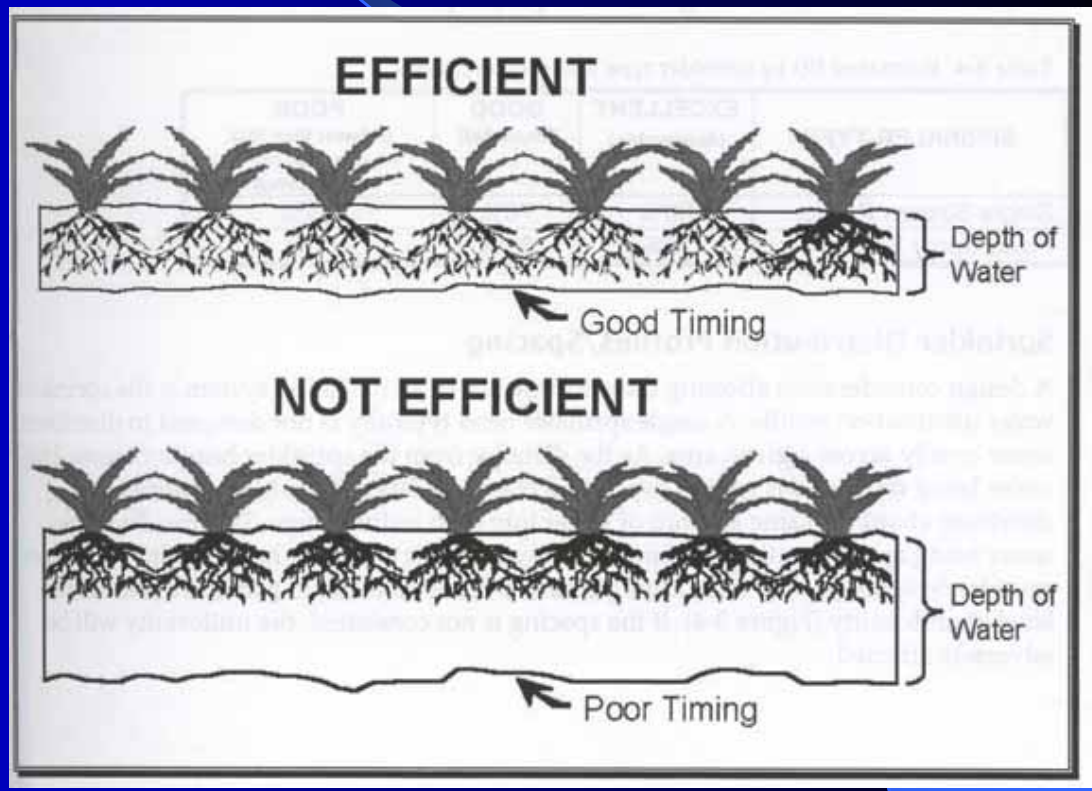
IRRIGATION EFFICIENCY

- The amount of water stored in the soil available to the landscape divided by the amount of water used by the sprinklers.



EFFICIENCY EFFECTS

- A well managed and maintained, properly designed and installed overhead irrigation system may have an efficiency as high as 80%. A poorly designed and managed system, 50% or lower. Efficiency can greatly affect water use, even when it varies only a small amount.



EFFICIENCY EXAMPLE

- A landscape needs 0.10 inches of water. The irrigation system needs to apply:
  - at 50%, 0.20 inches
  - at 60%, 0.167 inches
  - at 70%, 0.143 inches
  - at 80%, 0.125 inches

EFFICIENCY EXAMPLE

- To apply 0.12 inches of water with a 35 foot square spacing and four 2.5 gpm sprinklers.
  - At 60% efficiency requires 600 gpm
  - At 75% efficiency requires 480 gpm
  - 11,800 gallon difference over 90 days for just four sprinklers
  - 60 minutes versus 48 minutes watering time per cycle

WHY?

- What are the causes of low efficiency in an irrigation system?
  - Bad Design
  - Equipment Selection
  - Poor Installation
  - Improper Operation and Management
  - Reduced Maintenance

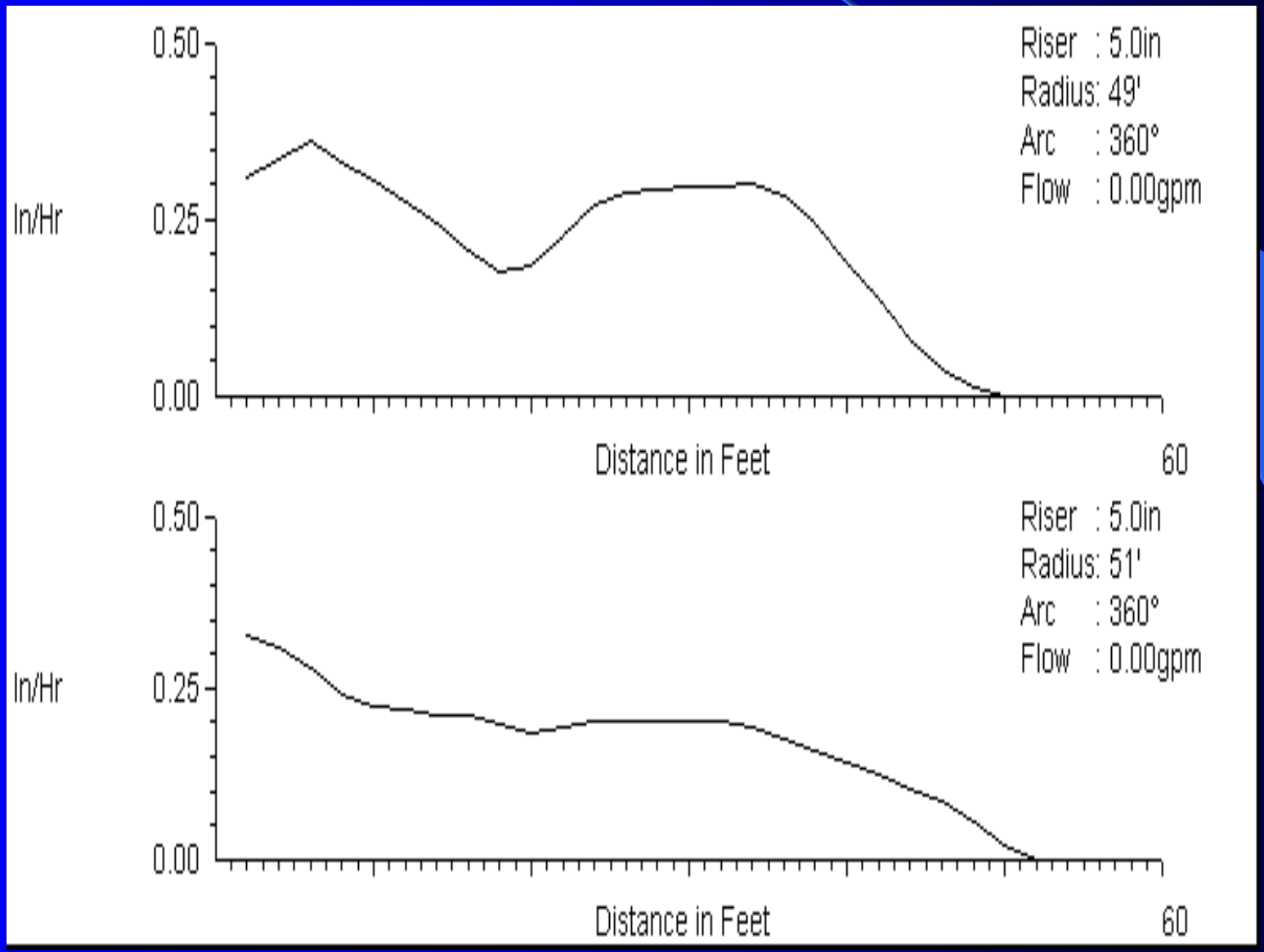
SPRINKLERS

- New Nozzles
- Better Uniformity/ Distribution
- Lower Operating Pressures
- Pressure Regulation

UNIFORMITY

- How evenly the sprinkler applies water to the area being irrigated.
- A measure of how uniform the sprinkler's application is over its distribution profile.
- Good in golf, but just starting to improve in the non-golf areas.

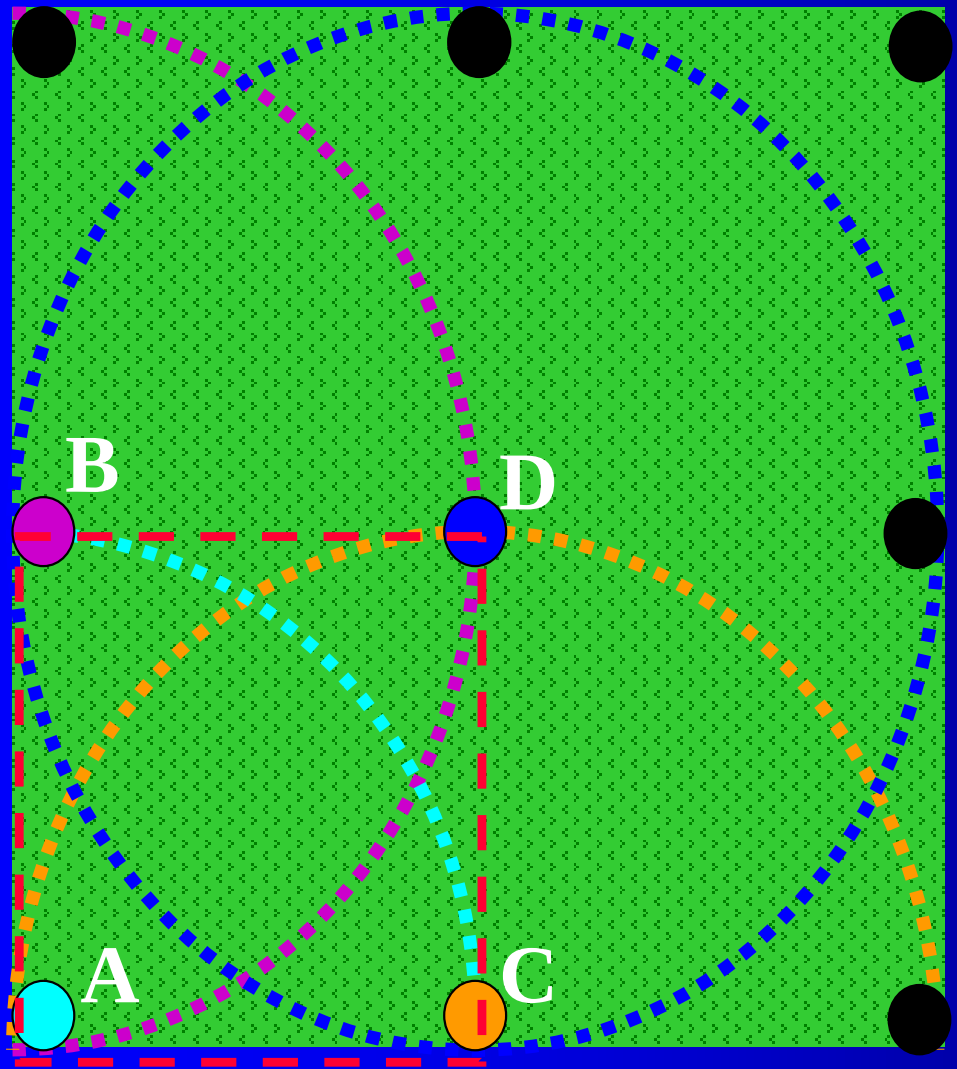
IMPROVED UNIFORMITIES



MATCHED PRECIPITATION

- Matched precipitated nozzles have the amount of water output by the sprinklers proportional to the area that the sprinkler covers.
- Failure to match precipitate the nozzles dramatically effects the system uniformity.
- Not necessarily a new technology, but it is getting easier to accomplish.

MATCHED PRECIPITATION



Proportionate GPM

A = 1.2 gpm

B = 2.4 gpm

C = 2.4 gpm

D = 4.8 gpm

Therefore, each head is applying 1.2 gpm into the area within the spacing.

LOW VOLUME IRRIGATION

- Low Volume Irrigation
  - Drip
  - Soaker Hose
  - Micro Spray
- Water Quality
- Pressure Regulation
- Maintenance

RAIN SHUT OFFS

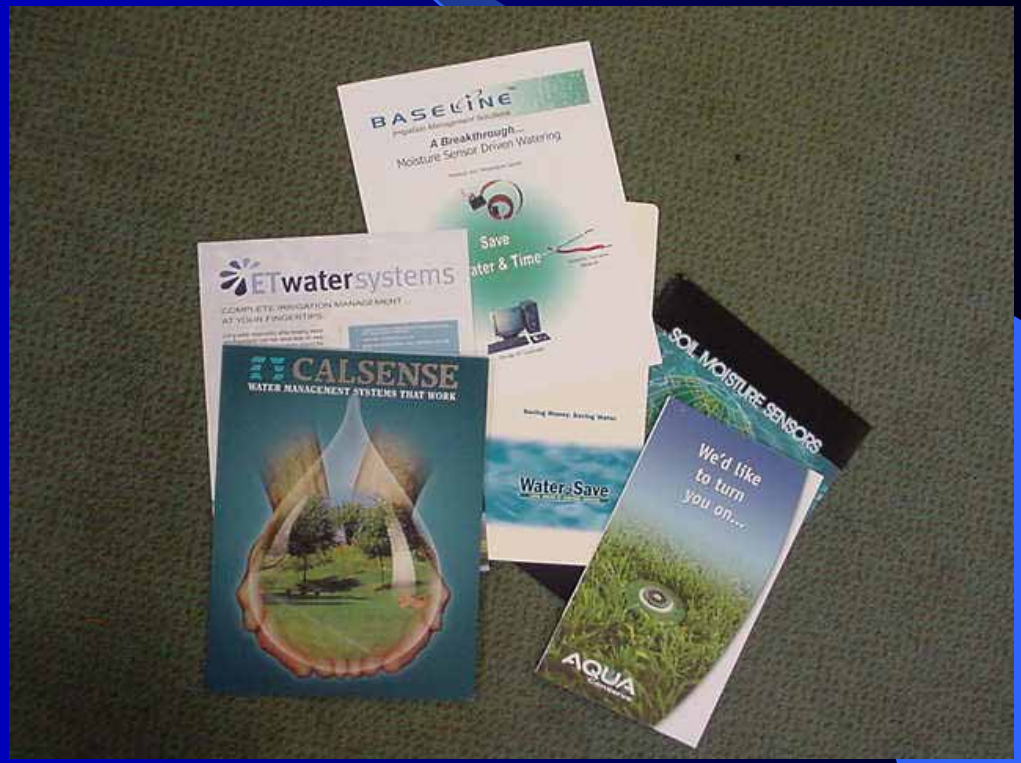
- Conventional
  - Hard Wire
- Wireless
  - Distance Restrictions
- Many states have passed or are considering mandatory rain shut off (system interruption) legislation.

MOISTURE SENSORS

- More accurate than rain shut offs
  - Viability
  - Can be difficult to Use
    - Calibration
    - Winterization
- Currently best used as a safety and not as an on/off switch.
  - Getting Better

S.W.A.T.

- Smart Water Application Technologies (S.W.A.T.)
  - ET Based Controllers
  - Moisture Sensor Based Control



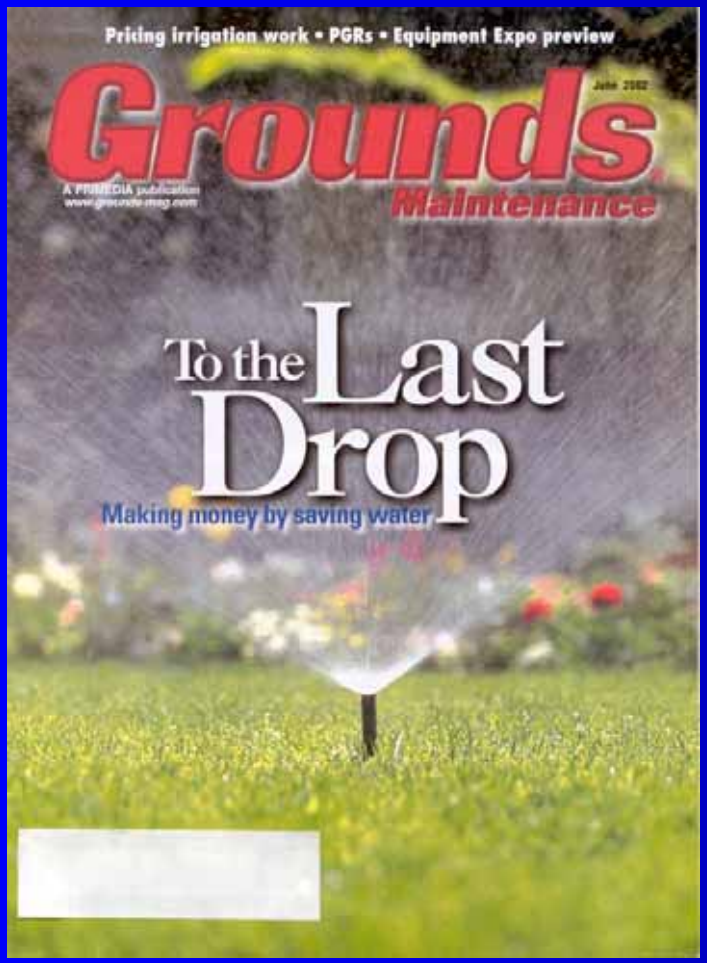
LABELING?

- Can these new and/or improved irrigation technologies be labeled as improving water efficiencies therefore reducing outdoor water use?

LABELING HURDLES

- Because irrigation is a system, will the end user understand that only specific components are reducing water use.
- Will labeling specific components of the system confuse or complicate the understanding of what is trying to be accomplished.
- Are there any real differences between a labeled and unlabeled component.

THE GOOD NEWS



- Manufacturers continue to improve the uniformity of sprinklers.
- New products are being developed to help reduce inefficiencies in irrigation systems such as pressure regulating sprinklers and ET based controllers.
- Certification and education programs continue to teach installers proper irrigation system installation procedures.

QUESTIONS

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